0.a. Goal

Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

0.b. Target

Target 9.b: Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities

0.c. Indicator

Indicator 9.b.1: Proportion of medium and high-tech industry value added in total value added

0.d. Series

Proportion of medium and high-tech manufacturing value added in total value added (%)

0.e. Metadata update

2022-03-31

0.f. Related indicators

4.4.1: Proportion of youth and adults with information and communications technology (ICT) skills, by type of skill

9.2.1: Manufacturing value added as a proportion of GDP and per capita

0.g. International organisations(s) responsible for global monitoring

United Nations Industrial Development Organization (UNIDO)

1.a. Organisation

United Nations Industrial Development Organization (UNIDO)

2.a. Definition and concepts

Definitions:

The proportion of medium-high and high-tech industry (MHT hereafter) value added in total value added of manufacturing (MVA hereafter) is a ratio value between the value added of MHT industry and MVA.

Concepts:

The value added of an industry (industry value added) is a survey concept that refers to the given industry's net output derived from the difference of gross output and intermediate consumption. Manufacturing sector is defined according to the International Standard Industrial Classification of all Economic Activities (ISIC) Revision 3 (1990) or Revision 4 (2008). It refers to industries belonging to sector D in revision 3 or sector C in Revision 4.

Technology classification is based on research and development (R&D) expenditure relative to value added otherwise referred as R&D intensity. Data for R&D intensity are presented in a report (Galindo-Rueda and Verger, 2016) published by the OECD in 2016, which also proposes a taxonomy for industry groups with different ranges of R&D expenditure relative to their gross value added. MHT industries have traditionally been defined exclusively to manufacturing industries. However, there have been recent efforts (Galindo-Rueda and Verger, 2016) to extend the definition to non-manufacturing industries as well. Nevertheless, medium-high and high technology sectors are primarily represented by manufacturing industries.

The following table includes the classification of MHT industries by ISIC Rev. 3 and ISIC Rev. 4.

ISIC Rev.4	Description	ISIC Rev.3	Description
20	Manufacture of chemicals and chemical products	24	Manufacture of chemicals and chemical products
21	Manufacture of basic pharmaceutical products and pharmaceutical preparations	29	Manufacture of machinery and equipment n.e.c.
252	Manufacture of weapons and ammunition	30	Manufacture of office, accounting and computing machinery
26	Manufacture of computer, electronic and optical products	31	Manufacture of electrical machinery and apparatus n.e.c.
27	Manufacture of electrical equipment	32	Manufacture of radio, television and communication equipment and apparatus

28	Manufacture of machinery and equipment n.e.c.	33	Manufacture of medical, precision and optical instruments, watches and clocks
29	Manufacture of motor vehicles, trailers and semi-trailers	34	Manufacture of motor vehicles, trailers and semi-trailers
30*	Manufacture of other transport equipment	35**	Manufacture of other transport equipment
325	Manufacture of medical and dental instruments and supplies		

***** Excluding 301 (Building of ships and boats)

****** Excluding 351 (Building and repairing of ships and boats)

MVA is the value added of manufacturing industry, which is Section C of ISIC Rev.4, and Section D of ISIC Rev.3.

2.b. Unit of measure

Percent (%)

2.c. Classifications

International Standard Industrial Classification of all Economic Activities (ISIC) Revision 4

International Standard Industrial Classification of all Economic Activities (ISIC) Revision 3

3.a. Data sources

Data can be found in UNIDO INDSTAT4 Database by ISIC Revision 3 and ISIC Revision 4 respectively.

3.b. Data collection method

Data are collected using General Industrial Statistics Questionnaire which is filled by National Statistical Offices (NSOs) and submitted to UNIDO annually. Data for OECD countries are obtained directly from OECD. Country data are also collected from official publications and official websites.

3.c. Data collection calendar

Data are collected annually from NSOs and OECD.

3.d. Data release calendar

UNIDO INDSTAT database is updated between March and April every year.

3.e. Data providers

National statistical offices (NSOs) in non-OECD countries, and OECD countries by OECD.

3.f. Data compilers

United Nations Industrial Development Organization (UNIDO)

3.g. Institutional mandate

UNIDO, as the specialized UN agency on industrial development, has the international mandate for collecting, producing and disseminating internationally comparable industrial statistics. UNIDO’s mandate covers (i) the maintenance and updating of international industrial statistics databases; (ii) methodological and analytical products based on statistical research and experience of maintaining internationally comparable statistics; (iii) contributions to the development and implementation of international statistical standards and methodology; and (iv) technical cooperation services to countries in the field of industrial statistics. With the repositioning of UNIDO as the focal agency for inclusive and sustainable industrial development (ISID), its statistical mandate was expanded to cover all dimensions of industrial development, including its inclusiveness and environmental sustainability.

4.a. Rationale

Industrial development generally entails a structural transition from resource-based and low technology activities to MHT activities. A modern, highly complex production structure offers better opportunities for skills development and technological innovation. MHT activities are also the high value addition industries of manufacturing with higher technological intensity and labour productivity. Increasing the share of MHT sectors also reflects the impact of innovation.

4.b. Comment and limitations

Value added by economic activity should be reported at least at 3-digit ISIC for compiling MHT values.

4.c. Method of computation

The indicator is calculated as the share of the sum of the value added from MHT economic activities to MVA.

$$\frac{\text{Sum of value added in MHT economic activities}}{\text{MVA}} * \times 100$$

4.d. Validation

UNIDO engages with countries in regular consultations during the data collection process to ensure the data quality and international comparability.

4.e. Adjustments

Data are collected through the UNIDO General Industrial Statistics Questionnaire to receive information on differences in concept, scope, coverage and classification used. The final data are adjusted to follow ISIC and facilitate international comparability.

4.f. Treatment of missing values (i) at country level and (ii) at regional level

• At country level:

Missing values are imputed based on the methodology from Competitive Industrial Performance Report (UNIDO, 2016).

• At regional and global levels:

Imputation applied at country level.

4.g. Regional aggregations

Regional and global aggregates are calculated as a weighted average of countries' MHT shares in a group. Weights are taken based on the MVA share in a group (UNIDO MVA Database).

4.h. Methods and guidance available to countries for the compilation of the data at the national level

International Recommendations for Industrial Statistics (IRIS) 2008

https://unstats.un.org/unsd/publication/seriesM/seriesm_90e.pdf

International Standard Industrial Classification of All Economic Activities (ISIC)

https://unstats.un.org/unsd/classifications/Econ/isic

4.i. Quality management

UNIDO published a handbook for statisticians involved in the regular industrial statistics programmes of NSOs or line ministries (Industrial Statistics - Guidelines and Methodology). It describes the statistical methods related to the major stages of industrial statistics operation. Moreover, UNIDO has established a quality management framework based on the internationally recognized guidelines recommended by IRIS to ensure quality of statistical products.

4.j. Quality assurance

The UNIDO Quality Assurance Framework is followed to ensure that the statistical activities of UNIDO are relevant and the data compiled and disseminated are accurate, complete within the defined scope and coverage, timely, comparable in terms of internationally recommended methods and classification standards and internally coherent to variables included in the datasets. While these generally accepted, broad dimensions of quality of statistical data may be defined in each NSO's own quality assurance framework. UNIDO makes maximum effort that data produced from the statistical operation undertaken with the UNIDO technical cooperation are accurate, internationally comparable and coherent.

4.k. Quality assessment

UNIDO employs a wide range of data quality techniques and consultations with national providers to assure quality principles supported by the Fundamental Principles of Official Statistics.

5. Data availability and disaggregation

Data availability:

More than 150 economies

Time series:

Data for this indicator are available from 2000 in the UN Global SDG Database, but longer time series are available in the CIP database.

Disaggregation:

No disaggregation available.

6. Comparability/deviation from international standards

Sources of discrepancies:

Conversion to USD or difference in ISIC combinations may cause discrepancy between national and international figures.

7. References and Documentation

URL:

www.unido.org/statistics

https://stat.unido.org/

References:

Competitive Industrial Performance (CIP) report 2018.
https://www.unido.org/sites/default/files/files/2019-05/CIP_Report_2019.pdf

International Standard Industrial Classification of All Economic Activities 2008.
https://unstats.un.org/unsd/publication/seriesm/seriesm_4rev4e.pdf

Galindo-Rueda, F. and F. Verger (2016). OECD Taxonomy of Economic Activities Based on R&D Intensity, OECD Science, Technology and Industry Working Papers, 2016/04, OECD Publishing, Paris. Available at:

http://dx.doi.org/10.1787/5jlv73sqqp8r-en

UNIDO (2009). UNIDO Data Quality: A quality assurance framework for UNIDO statistical activities https://open.unido.org/api/documents/4814740/download/UNIDO-Publication-2009-4814740

UNIDO (2010). Industrial Statistics - Guidelines and Methodology
https://www.unido.org/sites/default/files/2012-07/Industrial%20Statistics%20-%20Guidelines%20and%20Methdology_0.pdf

UNIDO (2013). The Industrial Competitiveness of Nations 2013.
https://www.unido.org/sites/default/files/2013-07/Competitive_Industrial_Performance_Report_UNIDO_2012_2013_0.PDF